

Appl. No. 10/750,428
Amdt. Dated October 12, 2004
Reply to Office Action of July 13, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): A system for evaluating or calibrating a bubble detector, comprising:

- a conduit adapted to pass a flow material therethrough;
- a pump operatively coupled to the conduit to pump the flow material through the conduit;
- a bubble-forming device operatively coupled to the conduit, the bubble-forming device being adapted to introduce bubbles into the flow material passing through the conduit; and
- a bubble detector to be evaluated positioned to examine the bubbles in the flow material passing through the conduit.

Claim 2 (currently amended): The system, as set forth in claim 1, comprising:

- an ~~elevation~~ evaluation device positioned to examine the bubbles in the flow material passing through the conduit.

Claim 3 (original): The system, as set forth in claim 1, wherein the pump comprises a peristaltic pump.

Claim 4 (original): The system, as set forth in claim 1, wherein the pump is capable of pumping the flow material through the conduit at a plurality of flow rates.

Claim 5 (original): The system, as set forth in claim 1, wherein the bubble-forming device comprises:

- a connecting device operatively coupled to the conduit;

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a bubble-forming capillary adapted to be positioned within the connecting device in communication with the flow material passing through the conduit; and

a bubble-pumping device operatively coupled to the bubble-forming capillary, the bubble-pumping device adapted to deliver a bubble-forming material to the flow material in the conduit through the bubble-forming capillary to create bubbles in the flow material.

Claim 6 (original): The system, as set forth in claim 5, wherein the capillary comprises:

a proximal portion operatively coupled to the bubble-pumping device and a distal portion slidably positioned within the connecting device.

Claim 7 (original): The system, as set forth in claim 5, wherein the bubble-pumping device comprises a syringe.

Claim 8 (original): The system, as set forth in claim 5, wherein the bubble-pumping device is adapted to deliver the bubble-forming material at a plurality of bubble flow rates and sizes.

Claim 9 (currently amended): The system, as set forth in claim 1, comprising:

a pulse dampener operatively coupled the conduit lumen between the pump and the bubble-forming device.

Claim 10 (original): The system, as set forth in claim 1, wherein the flow material comprises a surfactant.

Claim 11 (original): The system, as set forth in claim 2, wherein the evaluation device comprises:

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a previously evaluated bubble detector having a known bubble detection resolution.

Claim 12 (original): The system, as set forth in claim 2, wherein the evaluation device comprises:
an inspection device adapted to record bubbles formed by the bubble-forming device.

Claim 13 (currently amended): The system, as set forth in claim 12, wherein the inspection device comprises a camera operatively positioned proximate the ~~connecting~~ bubble-forming device.

Claim 14 (original): A method of evaluating or calibrating a bubble detector comprising the acts of:

- (a) pumping a flow material through a conduit;
- (b) introducing bubbles into the flow material;
- (c) examining the bubbles in the flow material with a bubble detector under evaluation; and
- (d) detecting the bubbles in the flow material.

Claim 15 (original): The method, as set forth in claim 14, wherein act (b) comprises the act of:
using a capillary to inject bubbles into the flow material.

Claim 16 (original): The method, as set forth in claim 15, wherein the act of using a capillary comprises the act of:

slidably positioning the capillary within the flow material to adjust the size of the bubbles.

Claim 17 (original): The method, as set forth in claim 15, wherein the act of using a capillary comprises the act of:

pumping a bubble-forming material through the capillary and into the flow material.

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Claim 18 (original): The method, as set forth in claim 14, wherein act (b) comprises the act of:
introducing a gas into the flow material to create the bubbles.

Claim 19 (original): The method, as set forth in claim 14, comprising the act of:
mitigating pressure oscillations within the flow material.

Claim 20 (original): The method, as set forth in claim 14, wherein act (c) comprises the act of:
using an ultrasonic probe to examine the bubbles in the flow material at a plurality of ultrasonic
signal levels.

Claim 21 (original): The method, as set forth in claim 14, wherein act (d) comprises the act of:
detecting the bubbles by visual inspection.

Claim 22 (original): The method, as set forth in claim 14, wherein act (d) comprises the act of:
detecting the bubbles using a bubble detector having a known bubble detection resolution.

Claim 23 (original): The method, as set forth in claim 14, comprising the act of:
comparing the examination of the bubbles in the flow material with the bubble detector with
the detection of the bubbles in the flow material to calibrate the bubble detector.

Claim 24 (original): The method of claim 23, comprising the acts of:

- (a) calculating a calibration factor from the examination of the bubbles in the flow material
with the bubble detector and the detection of the bubbles in the flow material; and
- (b) applying the calibration factor to the bubble detector to calibrate the bubble detector.

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Claim 25 (original): The method, as set forth in claim 14, wherein act (a) comprises the act of:
pumping the flow material in the conduit at a plurality of flow rates.

Claim 26 (original): The method, as set forth in claim 14, wherein act (b) comprises the act of:
altering the size of the bubbles.

Claim 27 (original): The method, as set forth in claim 14, wherein act (b) comprises the act of:
altering a formation rate of the bubbles.

Claim 28 (original): The method, as set forth in claim 24, wherein act (b) comprises the act of:
programming the calibration factor into a memory of the bubble detector.

Claims 29-60 (cancelled)